Annexure-1

Specifications for Sl. No:1 Contamination Monitor

Sl No	Parameter	Description	Supplier's remark on compliance/deviation
1.	Item	Contamination Monitor (portable)	
2.	Purpose	To assess beta, beta-gamma and alpha surface contamination on floor, equipments, surfaces and skin in nuclear power plant.	
3.	Detector	Geiger Muller Pancake. Protective grid shall be at least 80% transparent.	
4.	Contamination measurement range	Counts from 0 to 10,000CPS or more Surface activity measurement from 0 to 5000Bq/cm^2 or more Fixed contamination (Dose-rate) from 0.10 µSv/h to 5000 µSv/h or more	
5.	Display	Display shall be LCD display having provision for display of alarm and status report. Display unit shall be in cps, Bq, µSv/h and Bq/cm^2. For the Bq and Bq/cm^2 mode, user shall be able to select different nuclides from built-in library. The following radionuclides must be there in the built-in library: Cs-137, Am-241, I-131, Sr-90, Co-60.	
6.	Measurement intervals	Automatic adjustment from 1 to 60 seconds, Adjustable in count up mode by buttons	
7.	Alarm	Visual and acoustic. Provision to set at least one alarm threshold	
8.	Case	Suitable protective case shall be given for storage	
9.	Battery	Readily available batteries like AA type	
10.	Operational temperature range:	From 15 ^oC to 40 ^oC	
11.	Approximate Weight	Around 400g or less	
12.	Approximate Dimensions	Dimensions should be approximately within 85mm x 25mm x 140mm so that it can comfortably fit inside coverall pocket. The contamination monitor shall be handy and should not have external cables	
13.	Manual	User manual and maintenance manual (soft as well as hard copy) shall be provided	
14.	Warranty	Warranty period and its coverage shall be minimum 1 year after commissioning at KGS and be clearly mentioned	
15.	Additional requirements	Energy response curve shall be supplied Calibration certificate shall be supplied EMI standards in accordance with IEC norm 61000-3	

Specifications for Sl. No:2 Medium Range Survey Meters

Sl No	Parameter	Description	Supplier's remark on

			compliance/deviation
1.	Item	Medium Range Gamma Survey Meters	
2.	Purpose	Medium range survey meters are used for surveying moderate gamma radiation field during normal operation and during shutdown	
3.	Detector	Energy compensated GM tube, Gamma energy response according to H*(10)	
4.	Range	It shall be able to measure dose-rate of 10µSv/h (or less) to 100mSv/h (or more). Display range shall be from 1 µSv/h to 100mSv/h	
5.	Energy range	For measuring gamma and X-rays from 50keV to 3MeV	
6.	Alarm	It shall have provision for acoustical and visual alarm	
7.	Display Unit	Display shall be illuminated LCD display	
8.	Energy supply	AA type	
9.	Operational temperature	Operational temperature range shall be from 15°C to 40° C or better.	
10.	Approximate Weight	Weight shall not be more than approximately 250 g (including batteries)	
11.	Approximate Dimensions	The medium range gamma radiation survey meter shall be a small hand held, battery-operated survey instrument. Dimensions shall be approximately within 85mm x 40mm x 140mm so that it can comfortably fit inside coverall pocket.	
12.	Manual	User manual and maintenance manual shall be provided	
13.	Warranty	Warranty period and its coverage shall be minimum 1 year after commissioning at KGS and be clearly mentioned	
14.	Additional requirements	Energy response curve shall be supplied Calibration certificate shall be supplied EMI standards in accordance with IEC norm 61000-3	

Specifications for Sl. No:3 Low Range Survey Meter

Sl No	Parameter	Description	Supplier's remark on compliance/deviation
1.	Item	Low Range Gamma Radiation Survey Meter	
2.	Purpose	To assess low level gamma radiation field inside nuclear power plant	
3.	Detector	Detector shall be energy-compensated GM tube or NaI(Tl), gamma energy response according to H*(10)	
4.	Dose-rate measurement range	0.01 µSv/h to 0.01 Sv/h or more	
5.	Energy response	It shall measure gamma and X-rays from 50keV to 3MeV	
6.	Measurement resolution	Three significant digits or 0.01 µSv/h on dose rate	
7.	Configurable units	µSv/h, mSv/h, Sv/h	
8.	Display Unit	Display shall be illuminated LCD display	
9.	Alarm	Configurable audible and visual alarm	
10.	Communication	RF-communication or USB-communication with suitable adapter	

11.	Power supply	AA type	
12.	Approximate Weight	Approximately less than 250 g with batteries	
13.	Approximate Operating temperature	15°C to 40°C or better	
14.	Case	Suitable protective case shall be given for storage. The monitor shall be water proof including battery compartment so that the monitor can be used for environmental survey in rainy season	
15.	Accessories	Accessories like pouch, pocket/belt clip shall be provided	
16.	Approximate Dimensions	The low range gamma radiation survey meter shall be a small hand held, battery-operated survey instrument. Dimensions should be approximately within 85mm x 40mm x 140mm so that it can comfortably fit inside coverall pocket. The monitor shall have ergonomic design	
17.	Manual	User manual and maintenance manual (soft as well as hard copy) shall be provided	
18.	Warranty	Warranty period and its coverage shall be minimum 1 year after commissioning at KGS and be clearly mentioned	
19.	Additional requirements	Energy response curve shall be supplied Calibration certificate shall be supplied EMI standards in accordance with IEC norm 61000-3	

Specifications for Sl. No:4 Alpha Beta Counter

Sl No	Parameter	Description	Supplier's remark on compliance/deviation
1.	Item	Alpha-beta Counter	
2.	Purpose	For assessing loose contamination of personnel, instruments, floor, personnel protective items etc. in addition to assessing system activities.	
3.	Radiation Detected	Alpha and Beta Particles	
4.	Detector	ZnS(Ag) adhered to Plastic Scintillator mounted on PMT	
5.	Efficiency (2pi Geometry)	Greater than or equal to 50% for Pu^{239}, 60% for Th^{230}, 40% for Sr^{90}/ Yr^{90}, 10% for C^{14}	
6.	Background	Less than 3cpm for Alpha particles, less than 80cpm for beta	
7.	Crosstalk	Alpha to Beta <10%, Beta to Alpha <1%	
8.	Electronics	All solid state, Micro-Controller based design	
9.	Operating Mode	Preset Timer, 9999 Secs	
10.	Sample holder	Sample holder shall accommodate 3.5cm diameter	

		planchette	
11.	Menu Display	Counts : 999999 or more, Time : 9999 sec or more	
12.	HV Supply	Adjustable by setting the heliport with graduated dial	
13.	Data storage	Store and recall facility for data more than 500 readings. Compatible PC shall be supplied if data storage is via PC	
14.	Data transfer	For PC : USB 2.0	
15.	Power	240V, 50 Hz AC mains supply	
16.	Manual	User manual and maintenance manual (soft as well as hard copy) shall be provided	
17.	Warranty	Warranty period and its coverage shall be minimum 1 year after commissioning at KGS and be clearly mentioned	
18.	Additional requirement	Calibration certificate shall be provided	